

SPECIAL AEROSPACE SERVICES

Providing Innovative Aerospace Services and Solutions for the Next Generation

Corporate Overview & Capabilities Summary

05-20-09





SAS Introduction

■ Founded in 2006

- ❖ **SAS** is a Small, Woman-Owned Company (LLC)
- ❖ 20 Employees in strategic locations
- ❖ Headquartered in Boulder, Colorado

■ SAS is an Experienced and Dedicated Team

- ❖ Senior Systems Engineers, Chief Engineers, Ground Systems, Satellite Systems

■ Core Competencies - Technical Expertise

- ❖ Human Spaceflight-Human Rating
- ❖ Liquid and Solid Propulsion Technology
- ❖ Spacecraft Integration & Simulations
- ❖ Requirement Assessment and Evaluation
- ❖ Threat/Foreign Technology Assessment
- ❖ Mission Assurance-IV&V
- ❖ SEI&T Expertise
- ❖ Missile Defense Technology Support

■ Vision and Mission

- ❖ **Vision:** Provide experienced, high caliber, space systems engineers to augment needs in the USG and Industry
- ❖ **Mission:** Provide innovative and “realistic” development solutions, both programmatically and technically, with honesty and integrity





SAS Organization

SPECIAL AEROSPACE SERVICES

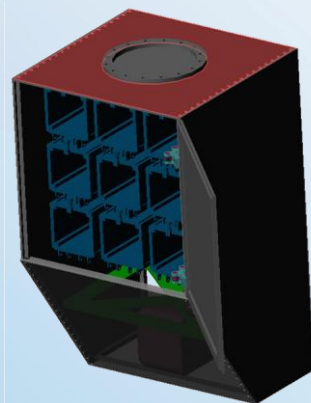
Services

- **System Engineering Services**
- **Launch Vehicle Development & Integration**
- **NASA Human Rating**
- **FAA Safety Certification**
- **Independent Validation & Verification**
- **Safety, Reliability & Mission Assurance**
- **Spacecraft Mission Integration**
- **Foreign Technology Assessment**
- **Weapons Demilitarization**
- **Strategic Planning**



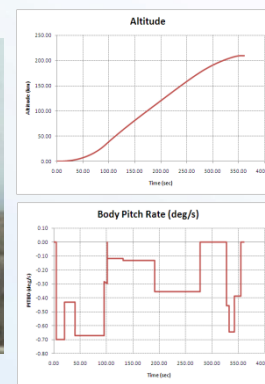
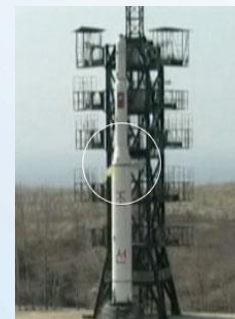
Systems

- **Conceptual Development**
- **Computer-based modeling**
- **Systems Prototyping**
- **Secondary payloads**
- **Specialized defensive systems**
- **Ground handling equipment**
- **Multiple small satellite dispensers**
- **Lunar Lander concepts**
- **QUIVER™**



Software & Mission Analysis

- **Analytical Tools**
- **Software Safety**
- **Software Assurance**
- **Independent S/W validation**
- **Space Mission Analysis**
- **Trajectory optimization**
- **Ballistic assessments**
- **Threat analysis**





SAS – NASA Work Efforts and Expansion

■ SAS Existing NASA Work:

- ❖ COTS (Commercial Orbiting Transportation System)
- ❖ Cargo Resupply Services (CRS)
- ❖ Orion Software-System Safety (SRP support and safety advisory support)



■ Expansion into NASA Markets

- ❖ SAS is focused on expanding work in Huntsville, (Marshall Space Flight Center)
- ❖ SAS opened Cape Canaveral Office in April 2009
 - Support Kennedy Space Center (Constellation and Launch Services Programs)
 - Growth in National Security Space launch efforts
- ❖ Interface with NASA and Air Force efforts in National Space efforts





Small Business Summary

- **SAS qualifies in the following Small Business categories:**
 - ❖ Small Disadvantaged Business
 - ❖ Woman-Owned Business
 - ❖ Historically Underutilized Business (HUBZone) – certification in process
 - ❖ SBA 8(a) application pending

- **Motivated to work through Mentor Protégé programs**
 - ❖ Currently investigating opportunities with supportive large companies both in DoD and NASA Programs





Current Client Summary



NASA Goddard Spaceflight Center



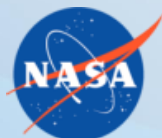
Orbital Sciences Corporation



ManTech/SRS Technologies



SAIC



NASA Johnson Space Center



United Launch Alliance



Ball Aerospace



SpaceDev



Locations

■ SAS has office locations and support staff in the following locations:

- ❖ Boulder, CO (Headquarters)
- ❖ Denver, CO
- ❖ Washington, DC (Dulles Office)
- ❖ Cape Canaveral, FL
- ❖ Houston, TX
- ❖ San Diego, CA
- ❖ Fort Wayne, IN

■ SAS 2009 office openings:

- ❖ Colorado Springs, CO
- ❖ Huntsville, AL



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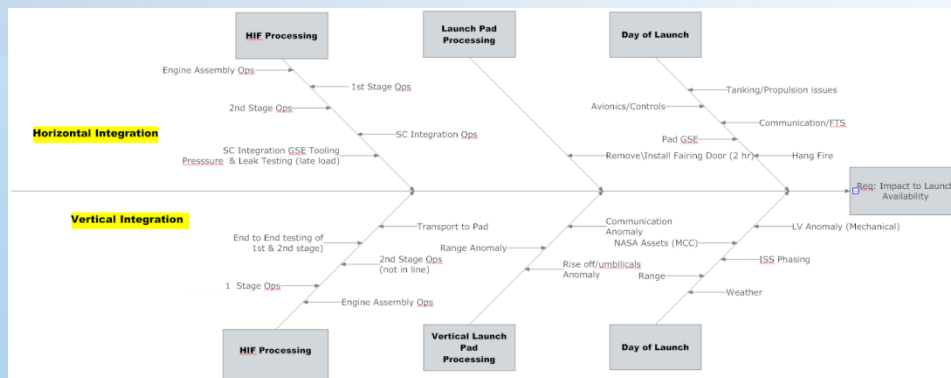
Providing Innovative Aerospace Services and Solutions for the Next Generation

Capability Summary



■ Applied System Engineering, Integration & Test Services

- ❖ **SAS** supports Requirements Development and Management, Requirement Impact Analysis, Integrated Systems Analysis, Trade Studies, Requirement Synthesis, and Independent Validation & Verification
- ❖ We develop independent tools and processes, and offer our clients requirements management (i.e. DOORs, CRADLE, INCOSE tools) support in establishing successful programs from the initial requirements validation and verification inception
- ❖ The experienced **SAS** team understands the cost and schedule impact of poorly defined requirements and utilizes both our analytical capability and programmatic experience to help our clients develop successful programs



Applying Cause & Effect Analysis to Requirements

■ Launch Vehicle Development & Integration

- ❖ **SAS** specializes in integration of Liquid Russian Propulsion systems (NK-33, NK-43, RD-180, RD-171, RD-108) and U.S. developed systems
 - RL-10, RS-68A&B, Merlin and hypergolic engine systems
 - System Matter Experts in Foreign Launch Systems and Subsystems
- ❖ **SAS** has experience in the development of every major launch system currently in development or production in the U.S., including foreign-developed systems
 - We offer this experience in support of our Nation's exploration program as well as our critical national security missions
- ❖ “Tip to Tail” expertise in launch vehicle ground systems, propulsion, structural tank design, avionics, mechanisms, fairings, and payload integration.





Services Group

■ NASA Human Rating & FAA Safety Certification

- ❖ **SAS** offers experience to the NASA Human Rating and FAA Commercial Spaceflight process
 - Our staff has hands-on experience in the development of FAA Safety Guidelines for commercial spaceflight
- ❖ **SAS** has developed a specialized process and proprietary software tools to navigate the regulatory environment under our **Spaceflight Safety**™ products and services
 - We are currently offering these products and services to NASA and organizations that are pursuing human spaceflight development activities
 - Leverage experienced team in Certifying Launch Systems to NPD's 8610.7/.23/.24





Services Group

■ *Independent Validation & Verification*

- ❖ **SAS** provides IV&V services to organizations with mission critical schedules
 - IV&V services include Launch Vehicle performance validation, dynamic environments, and spacecraft integration; launch site processing, and contractor manufacturing insight.
- ❖ **SAS** currently provides requirement validation and verification to NASA and our clients on new launch vehicle development, complex spacecraft integration, Interface Control Documents, and advanced programs.





Services Group

■ ***Safety, Reliability & Mission Assurance***

- ❖ **SAS** delivers expertise to existing mission assurance teams and provides our Technical Advisory Services to Government agencies and industry for their most critical missions or Programs
- ❖ **SAS** team members have performed software safety evaluation, reliability analysis, Fishbone and FMEA/FMECA analysis on launch systems, spacecraft, and complex space experiment programs
- ❖ Our expertise is seen in the design, development, and manufacturing for our Government clients in hardware pedigree reviews and audits
- ❖ The team's experience spans complex secondary payload programs, along with performing pedigree reviews and hardware acceptance activities for the U.S. Government at U.S. and Foreign-based suppliers.

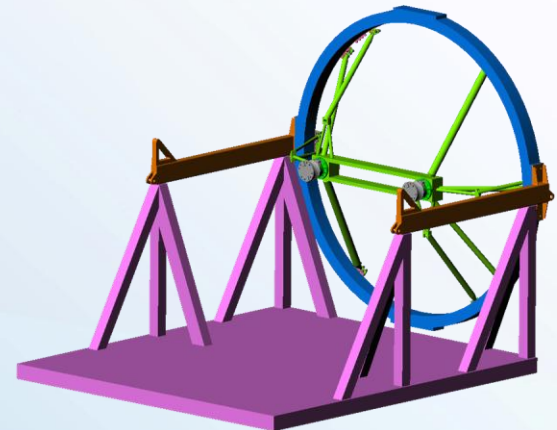
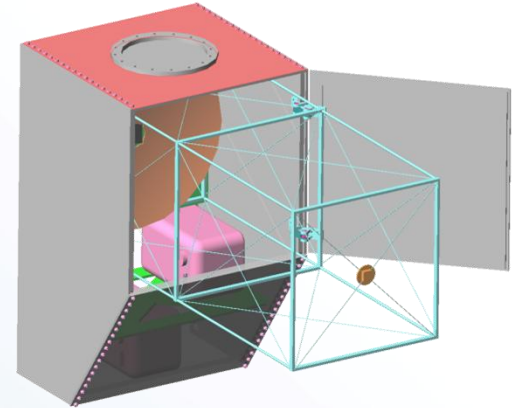
■ Foreign Technology Assessment & Weapons Demilitarization

- ❖ **SAS's** unique experience includes understanding and working on former Soviet Union launch systems, along with an experienced Russian and Ukrainian speaking team that can evaluate emerging aerospace technologies and capabilities
- ❖ **SAS** is currently supporting ongoing weapons demilitarization in Russia and Ukraine as well as offering translators to our clients
- ❖ **SAS** offers unique development perspectives on foreign-designed civil and strategic systems



■ SAS Systems Group

- ❖ **SAS** Systems Team is currently providing Conceptual Development & Requirements Evaluation to our existing clients with development of computer-based modeling, Proprietary Concept Development, and Prototyping for systems that include secondary payloads, specialized defensive systems, and ground handling equipment
- ❖ We are currently working on concepts for NASA including multiple small satellite dispensers, concepts for Altair lunar lander, as well as space base situational awareness technology demonstrator QUIVER™ utilizing both optical and radar solutions for a potential U.S. Government client
- ❖ **SAS** is providing computer-based modeling and evaluation of systems designs in support of complex manufacturing, concepts of operations, and validation of cost-effective requirements for launch site development





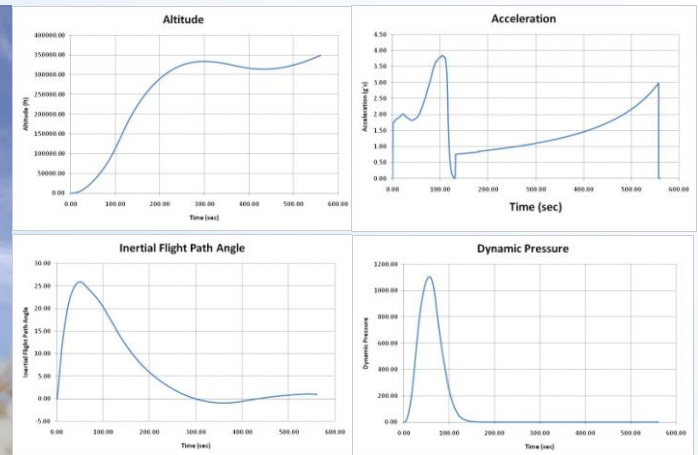
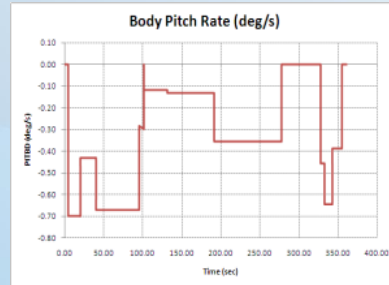
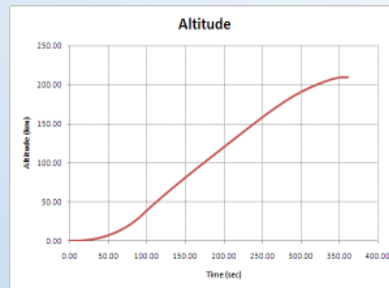
Software and Mission Analysis Group

■ SAS Software & Mission Analysis Group

- ❖ **SAS** Software and Mission Analysis group provides expertise and analytical products to support independent validation and verification in critical software launch systems and spacecraft
 - **SAS** is currently providing senior experts in software assurance, software safety, and independent software validation for NASA's Constellation and COTS Programs
- ❖ **SAS** is currently expanding our capability in Space Mission Analysis from launch through on-orbit operations
 - This includes launch system trajectory optimization, ballistic assessments, threat analysis, and space mission validation and verification data products.
- ❖ **SAS** is currently supporting a client working on NASA's Cargo Resupply Services Contract for the International Space Station Program
 - **SAS's** suite of tools includes POST, OTIS and other proprietary developed codes for evaluation of conceptual and existing space systems

■ SAS Software & Mission Analysis Group

- ❖ **SAS** Software and Mission Analysis group provides simulation of “what if” scenarios on US systems and foreign developed systems.





SAS Summary

■ Company Summary

- ❖ Committed to providing cost-effective solutions
- ❖ Committed program execution to our commercial clients and U.S. Government customers
- ❖ A small and nimble company
- ❖ Talent and ability to adjust to the needs of our clients
- ❖ Seasoned, experienced personnel on staff and ready to support

■ Contact Information

- ❖ Main Office: **303-625-1010**
- ❖ Website: www.specialaerospaceservices.com
- ❖ Mailing Address:

SAS, LLC
1630A 30th St.
Suite 593
Boulder, CO 80301

